SAĞLIK ve HEMŞİRELİK YÖNETİMİ DERGİSİ
JOURNAL of HEALTH and NURSING MANAGEMENT
Özgün Araştırma
Original Article

# The Autonomous Behavior Scale Regarding the Professional Roles of Nurses*

# Hemşirelerin Mesleki Rollerine İlişkin Özerk Davranış Ölçeğinin Geliştirilmesi

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* This article is derived from Gizem Açıkgöz' s PhD dissertation entitled "Development of an Autonomous Behavior Scale Regarding The Professional Roles of Nurses: A Qualitative Study", conducted under the supervision of Ülkü Baykal. This study is orally presented at the International Nursing Science Conference, held in London between August 20-22, 2023.

**Cite as:** Açıkgöz G, Baykal Ü. The autonomous behavior scale regarding the professional roles of nurses. Journal of Health and Nursing Management. 2024;11(3):509-520. **DOI:** 10.54304/SHYD.2024.58234

## Abstract

**Aim:** Nurse's autonomous behavior in professional roles is of great importance in ensuring nursing professionalism. The aim of this research was to develop Autonomous Behavior Scale Regarding Professional Roles of Nurses (ABSRPRN).

**Method:** A methodological research using instrument development and instrument verification phases: (1) creating the item pool, (2) preliminarily evaluating items and (3) refining the scale and evaluating psychometric properties. Data were collected between June and October 2022. Psychometric properties of scale were tested with 534 nurses. Content validity, construct validity, internal consistency and temporal stability were evaluated.

**Results:** The scale consisted of 23 items and four subdimensions; care, education, research, and management explained with 64.482% total variance. Model fit indices obtained with confirmatory factor analysis were at acceptable levels. Also, the convergent and discriminant validity of the scale was found sufficient. The scale was temporarily stable with 0.983 correlation and has a high internal consistency with 0.932 total Cronbach alfa coefficient.

**Conclusion:** The ABSRPRN with 23 items and four subdimensions is a psychometrically valid and reliable measurement instrument.

**Keywords:** Autonomy in Nursing, Professional Autonomy, Professional Nursing Roles, Scale Development.

## Öz

**Amaç:** Hemşirelerin profesyonel rollerindeki özerk davranışları, hemşireliğin mesleki rol ve sorumluluklarını sağlamada büyük öneme sahiptir. Bu araştırmanın amacı, "Hemşirelerin Profesyonel Rollerine İlişkin Özerk Davranış Ölçeği'ni (HPRİÖDÖ) geliştirmektir.

**Yöntem:** Ölçme aracını geliştirme aşamalarının kullanıldığı bu metodolojik araştırmada; (1) madde havuzunun oluşturulması, (2) maddelerin ön değerlendirmesi ve (3) ölçeğin geliştirilmesi ve psikometrik özelliklerinin incelenmesi yapılmıştır. Veriler, Haziran ve Ekim 2022 tarihleri arasında toplanmıştır. Ölçeğin geçerlik-güvenirlik özellikleri 534 hemşire ile test edilmiştir. İçerik geçerliliği, yapı geçerliliği, iç tutarlılık ve zamana ilişkin güvenirlik değerlendirilmiştir.

**Bulgular:** Geliştirilen ölçek, 23 maddeden ve dört alt boyuttan oluşmakta olup bakım, eğitim, araştırma ve yönetim şeklinde adlandırılmıştır. Ölçeğin, toplam varyansın %64,482'ni açıkladığı belirlenmiştir. Doğrulayıcı faktör analizi ile elde edilen model uyum indeksleri kabul edilebilir düzeyde bulunmuştur. Ayrıca, ölçeğin yakınsak ve ayırıcı geçerliliği 0,983 korelasyonla yeterli bulunurken, toplam Cronbach alfa katsayısının 0,932 ile yüksek iç tutarlılığa sahip olduğu belirlenmiştir.

**Sonuç:** "Hemşirelerin Profesyonel Rollerine İlişkin Özerk Davranış Ölçeği'nin (HPRİÖDÖ), 23 madde ve dört alt boyuttan oluştuğu, psikometrik olarak geçerli ve güvenilir bir ölçüm aracı olduğu saptanmıştır.

**Anahtar Sözcükler:** Hemşirelikte Özerklik, Profesyonel Özerklik, Profesyonel Hemşirelik Rolleri, Ölçek Geliştirme.

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**Recieved / Geliş:** 19.08.2024 ▪ **Accepted / Kabul:** 19.12.2024 ▪ **Published Online / Online Yayın:** 31.12.2024

## Introduction

Nursing is a health discipline that aims to protect and improve the health of individuals, families, and communities. It focuses on addressing problems that can be resolved through nursing interventions when health is compromised physically, mentally, or socially, aiming to promote healing and restore necessary functions (Kangasniemi et al., 2023; Perry, 2009; Zuzelo, 2024). Throughout the historical development of nursing, the profession has evolved from primitive practices in ancient times to the present, where modern living conditions prevail, playing a significant role in human life. Initially, nursing aimed to support individuals in need of care and to meet the health-related needs of individuals and communities. With advancements in nursing science and technology, the profession has rapidly progressed towards becoming a professional field (D'Antonio, 2022; Lee, 2023; Matthias and Hundt, 2023). The development of professional expertise in nursing has led to an increase in the authority and responsibilities of the nursing profession, expanding its independent roles and functions. In addition to the foundational roles of care, education, research, management, decision-making, and patient advocacy, contemporary nursing roles have emerged, including communication and coordination, rehabilitative, therapeutic, career development, autonomous and responsible, and advisory roles (Jasper, 2005; Kangasniemi et al., 2023). These roles contribute significantly to the development and professionalization of the nursing profession, requiring nurses to make autonomous decisions to perform their professional roles (Lee and Yang, 2015; Pesut et al., 2023).

Autonomy originates from the Greek word “autonomos” a combination of the words “auto” (self) and “nomos” (law) and means self-government (Swaine, 2016). Autonomy is one of the most valuable features that distinguishes humans from all other beings with the ability to think, and it also reveals the individual's ability and right to make decisions on her own. (Doğan and Can, 2009; Melo et al., 2016). The concept of autonomy is considered in two dimensions: individual and professional. Individual autonomy refers to the individual making decisions about himself based on his own values, and professional autonomy refers to the independence of a profession from other professions both conceptually and in practice and is defined as the control of professional members in professional practices and decisions (Göçmen Baykara and Şahinoğlu, 2013; Labrague et. al., 2019; MacDonald, 2002). Professional autonomy in nursing means that nurses make independent decisions in professional practices where care is the basis, in accordance with professional basic principles and rules, professional practice standards and legal regulations related to the profession (Labrague et. al., 2019; Orton, 2021; Santos et. al., 2017; Weston, 2008). Professional autonomy is of great importance for the improvement of nursing in this field, which has made great progress towards professionalism. It is one of the most basic requirements of professional development for nurses to be able to make autonomous decisions within their professional duties and authority areas, to follow the results of their decisions and to take responsibility for these results (Orton, 2021; Rao et. al., 2017).

Professional autonomy in nursing enhances clinical outcomes related to the care of individuals, ensures the continuity and safety of nursing care, and improves the quality of nursing care (Labrague et al., 2019; Rao et al., 2017; Santos et al., 2017). Moreover, it contributes to preventing complications, shorter hospital stays, and positive outcomes for patients, enhancing cost-effectiveness for hospital organizations. Simultaneously, nurses demonstrating autonomous behavior increase their control over practices, develop confidence in professional practices, and increase professional satisfaction and motivation (Lee, 2023; Oshodi et al., 2019; Rao et al., 2017). Labroque et al. (2019) reported in their cross-sectional research investigating predictors and outcomes of professional autonomy in nurses that "nurses demonstrated moderate levels of professional autonomy, with education and hospital bed capacity as strong predictors. Regression analysis showed positive effects of professional autonomy on nurses' job outcomes such as organizational commitment, job satisfaction, and work performance." Cerit et al. (2020), in their research examining the impact of autonomy levels on professional self-esteem in nurses, stated that nurses' autonomy is moderate, and that independent behavior significantly influences professional self-esteem. In the literature, national and international studies evaluating the individual and professional autonomy of nurses have been encountered. However, no research or measurement tool has been found that evaluates nurses' professional autonomy within the framework of professional roles. This research aims to determine nurses' opinions on their autonomous behaviors related to professional roles and to develop the 'Nurses' Autonomous Behavior Scale Regarding Professional Roles.

## Method

**Aim and Design:** The aim of this research was to develop an instrument to evaluate the autonomous behaviors of nurses regarding their professional roles and to assess its psychometric properties.

This was a scale development research using a three-phase design: (1) creating the item pool, (2) preliminarily evaluating items and (3) refining the scale and evaluating psychometric properties (Table 1).

**Table 1. Development phases of the Autonomous Behavior Scale Regarding the Professional Roles of Nurses**

| | | |
|---|---|---|
| **PHASE 1: Creating the Item Pool** | | |
| **Qualitative Research**<br>Face-to-face, semi-structured, in-depth individual interviews (n:17)<br>**Literature review**<br>Databases searched (PubMed, Wiley and Web of Science) | | **Item Pool**<br>59 items |
| **PHASE 2: Preliminarily Evaluating Items** | | |
| **Expert Opinion**<br>Nursing (13)<br>Linguistic (2) | ***Davis Technique***<br>I-CVI and S-CVI were calculated<br>3 items were removed (I-CVR <0.80)<br>6 items were added with the view of experts | **Draft Scale**<br>62 items |
| **Pilot Study**<br>Nurses (30) | Items with poor understanding were revised | **Draft Scale**<br>62 items |
| **PHASE 3. Refining the Scale and Evaluating Psychometric Properties** | | |
| **Item Analysis** | Item total correlation was calculated<br>The items correlation coefficients ≤.40 were removed (31 items) | **Scale**<br>31 items |
| **Construct Validity** | Kaiser-Meyer-Olkin (KMO) and<br>Bartlett sphericity test values were acceptable | **Scale**<br>23 items<br>4 sub-dimensions (care, education, research and management) |
| | ***Exploratory Factor Analysis***<br>The items factor loadings ≤.30 were removed (8 items) | |
| | ***Confirmatory Factor Analysis***<br>Model fit indices were acceptable or good level. | |
| | ***Convergent And Discriminant Validity Analysis***<br>Average variance explained (AVE) and the composite reliability (CR) were calculated | |
| **Reliability** | ***Temporal Stability***<br>No statistically significant difference between scale and the sub-dimensions<br>Strong and significant positive relationship was observed | |
| | ***Internal consistency***<br>Cronbach's alpha coefficient was found to be 0.932 for the overall scale and 0.771, 0.809, 0.918, and 0.896 for the sub-dimensions | |
| **Autonomous Behavior Scale Regarding the Professional Roles of Nurses**<br>23 items and 4 sub-dimensions | | |

**Creating the Item Pool:** The item pool was created using literature review and qualitative studies. Literature reviews were conducted via PubMed, Wiley and Web of Science databases. Total 42 article of research and review were used. Face-to-face, semi-structured, in-depth individual interviews were conducted with 17 nurses. After three consensus meeting to evaluate the judgment sentences, a 59 items pool was created. The 5-point Likert-scale were decided to use with "1" Never, "2" Seldom, "3" Sometimes, "4" Frequently and "5" Always.

**Preliminarily Evaluating Items**

*Content Validity by Expert Review:* A panel of 13 experts on nursing management evaluated the content validity of the scale via the four-point rating technique recommended by Davis. The experts scored each item as 1 point (not relevant), 2 points (relevant but needs some revision), 3 points (relevant but needs minor revision) and 4 points (relevant) in accordance with this technique (Davis, 1992; Taşkın and Akat, 2010). The Item Content Validity Index (I-CVI) for each item and the Scale Content Validity Index (S-CVI) for the total scale were calculated.

*Pilot Study:* The draft scale was applied to 30 nurses with similar characteristics to the sample group to evaluate the comprehensibility, readability, and response errors. Items that created ambiguity and could not be understood were rearranged by also getting the opinions of two linguists and the scale was finalized.

**Refining the scale and evaluating psychometric properties**

*Item Analysis:* The performance of each item was evaluated by calculating the item total correlation. The items that total correlation coefficient under 0.40 and causing the Cronbach alpha coefficient of the scale total to increase when deleted was respectively removed from the scale (Tabachnick and Fidell, 2013).

*Construct Validity:* Exploratory factor analysis (EFA), confirmatory factor analysis (CFA) and convergent and discriminant validity analysis (CDVA) were performed to evaluate the construct validity of the scale. Before conducting this validity method the suitability of the data was evaluated with the Kaiser–Meyer–Olkin (KMO) coefficient and Bartlett's sphericity test. Exploratory factor analysis was performed to determine the factor structure and loadings of the scale items and the total variance explained was tested. The scale which was found to have strong values as a results of exploratory factor analysis was evaluated with confirmatory factor analysis and fit index values were tested. Convergent and discriminant validity analysis (CDVA) were performed to evaluate the validity of the measurement model, average variance extracted (AVE) and composite reliability (CR) were calculated in the scale sub-dimensions.

*Reliability:* Temporal stability of scale was evaluated with the test–retest method. In order to evaluate the stability and reliability of the scale over time, the draft scale was applied twice, four weeks apart, to 30 nurses with similar characteristics to the sample group. Data were evaluated with t-test and Pearson correlation analysis in paired groups. Cronbach's alpha internal consistency analysis was performed to evaluate the internal consistency of the scale total and scale sub-dimensions.

**Sample and Settings:** The sample size of scale development studies is important for the validity and reliability of the scale. Hair et al. (1995) emphasized that the sample size in scale development studies should be over 100 people, and Tabachnick and Fidell (2018) emphasized that it should be at least 300 people. There are also researchers who emphasize that it is more appropriate to determine the number of people in the sample according to the number of items. According to this view, the sample size should be between 5 and 10 times the number of items. (Yurdabakan and Çüm, 2017).

In this research, the sample size was targeted to be 620, which would be 10 times the number of scale items, but 534 nurses could be reached at the end of the 4-month data collection process. As a result, approximately 9 times the number of items was reached. In addition the content validity sample consists of 13 experts, and the test retest sample consists of 30 nurses.

**Inclusion criterias:** Working in Istanbul, working in public, university or private hospitals, volunteering to participate in research.

**Exclusion criteria:** Not being a high school graduate.

**Data Collection:** The research was conducted with nurses working in university hospitals, public hospitals and private hospitals in Istanbul and who are members of the Turkish Nurses Association (TNS). The nurses' status of working in Istanbul and being a member of TNS were questioned at the online questionnaire. Data were collected using the snowball

method, which is one of the non-probability sampling methods. First, managers from 27 different hospitals were contacted and asked to share the survey with nurses. Data collection was carried out online due to the inability to obtain institutional permission under global epidemic conditions. The response time of the prepared form takes 8 to 12 minutes, and the draft scale items are designed to be answered sequentially. The announcements were repeated 8 times to reach the sample size (620 people), and at the end of the 4-month data collection process, the data collection process was completed with 534 participants who stated that they volunteered to participate in the research. The data were collected between June to October 2022.

**Ethical Consideration:** Ethical approval was received from Ethics Committee of a university in İstanbul in 06.10.2020 with approval number 59491012-604.01.02. Institutional permission was received from the Turkish Nurses Association Istanbul Branch. The purpose and scope of the research explained to the participants. It was pointed out thet the data obtained from the research would be kept confidential and would be used only within the scope of the research. Informed consent was obtained with the online questionnaire.

**Data Analysis:** The data were analysed with the SPSS 25 Statistic Program. The participants' characteristics and scale scores were determined via descriptive statistics (numbers, percentage, average, standard deviation). Davis technique was used to evaluate the content validity of the scale. In order to evaluate the understandability and suitability of the scale in terms of language and scope, Item Content Validity Index (I-CVI) and Content Validity Index (S-CVI) were calculated. In evaluating the construct validity of the scale, the item total correlation and Cronbach alpha coefficient were calculated to evaluate the quality of the scale items. The suitability of the research data for factor analysis was evaluated with the Kaiser-Meyer-Olkin (KMO) coefficient in terms of the appropriateness of the sample size and the Bartlett significance test in terms of the relationship between variables. First, exploratory factor analysis was performed to determine the construct validity and factor structure of the scale, and then confirmatory factor analysis was applied to test the resulting sub-dimensions. Finally, to test the tendency of the items to confirm each other, composite reliability analysis and average explained variance analysis and Convergent and discriminant validity analysis (CDVA) were performed and average variance extracted (AVE) and composite reliability (CR) were calculated. In evaluating the reliability of the scale, the reliability of the scale over time and the internal consistency of the scale and its sub-dimensions were examined. The reliability of the scale over time was evaluated by the test-retest method, and in this context, t-test, Pearson correlation analysis and intraclass correlation (ICC) analysis were performed in paired groups. Cronbach's alpha internal consistency analysis was used to determine the internal consistency of the scale and its sub-dimensions.

## Results

Characteristics of Participants: The age of the nurses ranged from 21 to 49 (Mean=31.8, SD=6.79). Most of them were female (85,2%) and almost half of them were married (53.6%). The graduation level of nurses were bachelor degree with 53.2% and postgraduate degree with 42.1%. The 71.2% of them work in public hospitals and 42.5% in inpatient services. Their professional experiences ranged from 1 to 28 (Mean=10,20, SD=7.33).

**Validity**

**Content Validity:** According to the results of 13 expert opinions collected in accordance with the Davis technique, I-CVIs ranged from 0.76 to -1.00, and the S-CVI was 0.90. Based on the evaluation results, three items (27, 37, 57) with Content Validity Ratios (I-CVIs) below 0.80 were excluded from the scale item pool, and six items were added to the scale item pool based on recommendations from expert opinions. It has been observed that the item total correlation coefficients of the draft scale ranged between 0.014 and 0.753 at the significance level of $p < 0.001$. Thirty-one items (9, 10, 11, 13, 14, 15, 20, 21, 23, 30, 31, 32, 34, 35, 36, 37, 38, 41, 42, 44, 51, 52, 53, 54, 55, 56, 57, 58, 60, 61, 62) with a total item correlation value below 0.40 were removed, reducing the number of scale items to 31. In the final version of the draft scale with 31 items, it was observed that the total item correlation values ranged between 0.467 and 0.735 at the significance level of $p < 0.001$.

**Construction Validity:** Construction validity of the scale was evaluated with exploratory factor analysis, confirmatory factor analysis and convergent and discriminant validity analysis (Table 2).

**Table 2. Construct validity of the Autonomous Behavior Scale Regarding the Professional Roles of Nurses**

| Factors | Items | Factor Analysis | Items of ABSRPRN | Factor Loadings | AVE | CR |
|---|---|---|---|---|---|---|
| **Factor 1 Care** | Item 2 | 0,641 | Item 1. I perform the necessary physical examination when planning nursing care. | 0,68 | 0,251 | 0,781 |
| | Item 3 | 0,621 | Item 2. I use laboratory findings when planning nursing care. | 0,66 | | |
| | Item 4 | 0,406 | Item 3. I use nursing diagnoses when planning nursing care. | 0,57 | | |
| | Item 5 | 0,777 | Item 4. I evaluate the effectiveness of the care I provide to the patient. | 0,71 | | |
| | Item 6 | 0,692 | Item 5. I take patient safety precautions when applying nursing care. | 0,49 | | |
| | Item 7 | 0,412 | Item 6. I monitor my patient when I see a need. | 0,54 | | |
| **Factor 2 Education** | Item 16 | 0,691 | Item 7. I determine the patient's educational needs regarding care. | 0,86 | 0,550 | 0,828 |
| | Item 17 | 0,814 | Item 8. I provide the patient with education appropriate to his needs using effective methods and tools. | 0,80 | | |
| | Item 18 | 0,548 | Item 9. I decide on the content of discharge training in line with the patient's needs. | 0,63 | | |
| | Item 19 | 0,617 | Item 10. I ensure that the patient receives training and consultancy from expert nurses regarding his needs. | 0,65 | | |
| **Factor 3 Research** | Item 24 | 0,710 | Item 11. I determine the issues that need to be researched regarding nursing. | 0,78 | 0,661 | 0,921 |
| | Item 25 | 0,841 | Item 12. I lead the initiation of nursing-related research. | 0,82 | | |
| | Item 26 | 0,841 | Item 13. I share the results of my research on nursing at scientific events. | 0,86 | | |
| | Item 27 | 0,732 | Item 14. I use evidence-based research results in nursing care processes. | 0,80 | | |
| | Item 28 | 0,874 | Item 15. I take an active role in research processes. | 0,87 | | |
| | Item 29 | 0,650 | Item 16. I follow current resources to improve my professional knowledge. | 0,74 | | |
| **Factor 4 Management** | Item 39 | 0,750 | Item 17. I take responsibility for the care I provide. | 0,80 | 0,591 | 0,921 |
| | Item 40 | 0,796 | Item 18. I make changes to the nursing care process when the patient's care needs change. | 0,80 | | |
| | Item 45 | 0,586 | Item 19. I prepare an incident notification report in unexpected/undesirable situations. | 0,68 | | |
| | Item 46 | 0,593 | Item 20. I take responsibility for my practices. | 0,70 | | |
| | Item 47 | 0,780 | Item 21. When necessary, I take over the management of the unit I work in. | 0,75 | | |
| | Item 48 | 0,675 | Item 22. When change is required regarding nursing services, I take an active role in the change process. | 0,81 | | |
| | Item 49 | 0,751 | Item 23. I lead patient care processes. | 0,81 | | |

| | | | | |
|---|---|---|---|---|
| **$\chi^2$ /df** | 1≤ $\chi$2 /df ≤3 | 3<$\chi$2 /df ≤ 5 | 3,20 | Acceptable |
| **RMSEA** | 0 ≤ RMSEA ≤ 0.05 | 0.05 <RMSEA ≤ 0.10 | 0.08 | Good |
| **NFI** | 0.95 ≤ NFI ≤ 1 | 0.90 <NFI < 0.95 | 0.93 | Good |
| **NNFI** | 0.95 ≤ NNFI ≤ 1 | 0.90 <NNFI < 0.95 | 0.93 | Good |
| **SRMR** | 0 ≤ SRMR < 0.05 | 0.05 ≤ SRMR < 0.10 | 0.09 | Good |
| **CFI** | 0.97 ≤ CFI ≤ 1 | 0.95 ≤ CFI < 0.97 | 0.95 | Acceptable |

**Exploratory Factor Analysis:** The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy for the scale was found to be 0.918, and the results of the Bartlett sphericity test ($\chi^2$ = 2549.930, df = 253, p < 0.000) indicate that the data are suitable for factor analysis. According to the results of the exploratory factor analysis (EFA), eight items (1, 8, 12, 22, 33, 43, 50, 59) with factor loadings below 0.30 were removed from the scale. The factor loadings of the retained scale items ranged from 0.406 to 0.841, and the total variance explained was found to be 64.482%. As a result, a scale consisting of 23 items and four sub-factors was obtained, and the items within the sub-dimensions of the scale were evaluated in terms of meaning, labeled as "care," "education," "research," and "management".

**Confirmatory Factor Analysis:** The validity of the scale, which was observed to have strong values according to the results of the exploratory factor analysis, has been tested through confirmatory factor analysis. The results of the confirmatory factor analysis indicate that the fit index values for the scale are $\chi^2$/df = 3.20, RMSEA = 0.008, NFI = 0.93, NNFI = 0.93, SRMR = 0.09, and CFI = 0.95. Also standardized model shows supportive results (Figure 1).

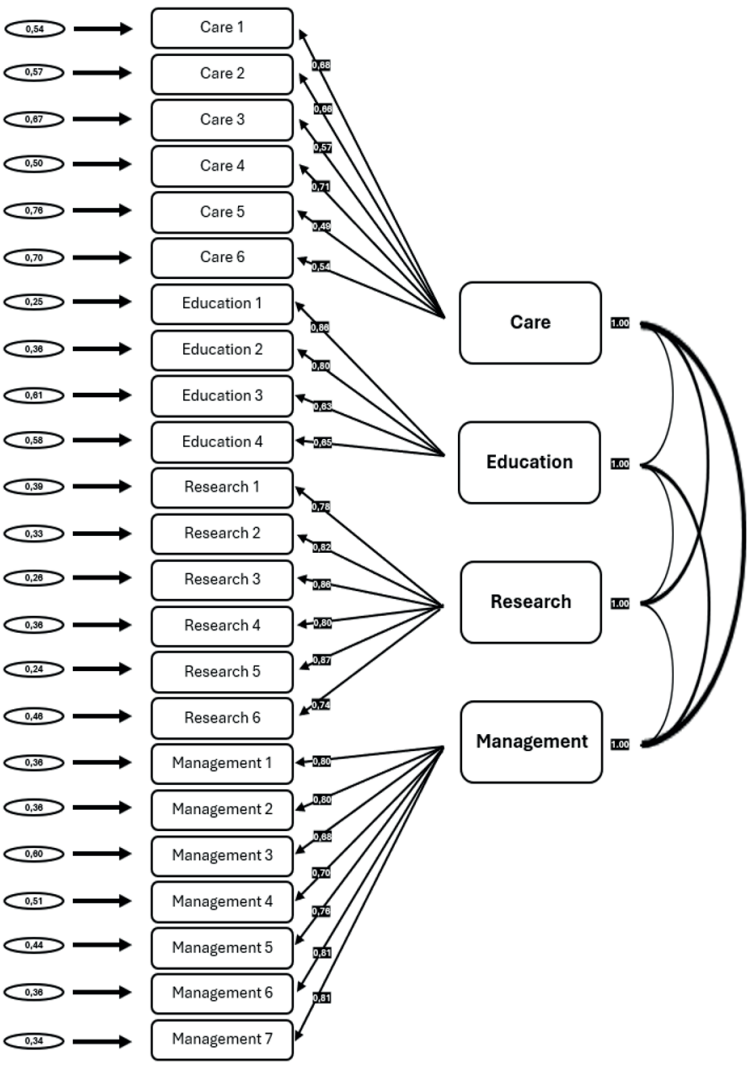


**Figure 1. Confirmatory factor analysis standardized model of the Autonomous Behavior Scale Regarding the Professional Roles of Nurses**

**Convergent and Discriminant Validity Analysis:** The selected fitting indexes showed that the second-order factor model has good fitting and verified the results of the EFA proposed by the previous theoretical model (Figure 1). In addition, analyses were conducted to test the convergent and discriminant validity of the scale. According to the results, the average variance explained (AVE) in the sub-dimensions of the scale ranged from 0.251 to 0.661, and the composite reliability (CR) ranged from 0.781 to 0.921.

**Reliability**

Reliability of the scale was evaluated with temporal stability and internal consistency analysis (Table 3).

**Table 3. Reliability of the Autonomous Behavior Scale Regarding the Professional Roles of Nurses**

| n=30 | Test | | Re-Test | | Test | | Pearson Correlation | |
|---|---|---|---|---|---|---|---|---|
| | Mean (SD) | Min-Max (Median) | Mean (SD) | Min-Max (Median) | t | p | r | p |
| **Care** | 4,67 (0,38) | 3,83-5 (4,83) | 4,73 (0,31) | 4-5 (4,83) | 0,706 | 0,486 | 0,996 | 0,001* |
| **Education** | 4,55 (0,51) | 3,25-5 (4,75) | 4,53 (0,68) | 2,25-5 (4,75) | 0,847 | 0,847 | 0,977 | 0,001* |
| **Research** | 4,25 (0,74) | 2,33-5 (4,5) | 4,03 (0,91) | 2,5-5 (4,33) | 1,178 | 0,248 | 0,993 | 0,001* |
| **Management** | 4,71 (0,41) | 3,57-5 (4,93) | 4,7 (0,43) | 3,29-5 (4,93) | 0,934 | 0,934 | 0,965 | 0,001* |
| **Total** | 4,54 (0,39) | 3,69-5 (4,68) | 4,5 (0,47) | 3,26-5 (4,64) | 0,619 | 0,619 | 0,983 | 0,001* |

| Subscales and Total | Cronbach's Alpha |
|---|---|
| Care | 0,771 |
| Education | 0,809 |
| Research | 0,918 |
| Management | 0,896 |
| Total | 0,932 |

t: Dependent group t test; *p<0.01.

**Temporal Stability:** Item scale correlations and Cronbach's alpha coefficient if item is deleted were calculated. Item-scale correlation coefficients were between 0.312 and 0.751. The Cronbach's alpha coefficient of the 23-item ABSRPRN was 0.923. According to the results of the test-retest analysis for the scale, there was no statistically significant difference between the mean scores for the overall scale and the sub-dimensions (total scale t: 0.619, $p < 0.619$). Additionally, a very strong and significant positive relationship was observed (total scale r: 0.983, $p < 0.001$).

**Internal Consistency Analysis**

In the internal consistency assessment of the scale, the Cronbach's alpha coefficient was found to be 0.932 for the overall scale and 0.771, 0.809, 0.918, and 0.896 for the sub-dimensions, respectively.

**Final Instrument:** As a result of validity and reliability assessments, a decision has been made to use the ABSRPRN consisting of 23 items and four dimensions, namely "care," "education," "research," and "management," for nurses. The assessment of the scale is conducted on a 5-point Likert scale, where 1-Never, 2-Rarely, 3-Sometimes, 4-Often, and 5-Always are scored. The minimum score that can be obtained from the scale is 23, and the maximum score is 115. As the score increases, it is interpreted that nurses' autonomous behaviors related to professional roles increase.

**Limitation:** Since it was collected online due to COVID-19, the targeted number of nurses' participation could not be reached, and balance could not be achieved between nurses' hospital groups. The research was completed with a sample of participants (71.2%) from Ministry of Health hospitals.

## Discussion

In nursing, professional autonomy holds significant importance in various aspects, including the quality and continuity of nursing care, the efficiency of the healthcare system, and satisfaction among both patients and healthcare professionals, particularly concerning clinical outcomes for individuals receiving care (Labrague et al., 2019; Oshodi et al., 2019). Notably, there has been no research or measurement tool in the literature that evaluates nurses' professional autonomy within the framework of their professional roles. This research aims to develop the ABSRPRN to assess nurses' professional autonomy concerning their roles.

**Psychometric Properties of ABSRPRN**

The content validity of the scale was evaluated according to the technique developed by Davis (1992), and it was observed that the content validity ratios (I-CVC) of the scale items and the content validity index (S-CVI) were at an acceptable level in the light of literature (>0.80). These results indicate that the generated item pool adequately represents the structure (Davis, 1992; McHugh, 2012).

In the development of a new scale, it is necessary to test the construct validity first with Exploratory Factor Analysis (EFA) followed by Confirmatory Factor Analysis (CFA) (Schmitt, 2011). Prior to these analyses, the normal distribution of the data, the appropriateness of the sample size for factor analysis, and the factorizability of the data should be assessed with the Kaiser-Meyer-Olkin (KMO) measure (>0.70) and the Bartlett sphericity test ($p < 0.001$). Being close of KMO to 1 indicates that the data group is suitable for factor analysis. The research data were found suitable for EFA and CFA tests in this context (Barendse et al., 2015; Boateng et al., 2018; Tabachnick and Fidell, 2013).

According to the EFA results, the ABSRPRN, with its four-factor structure, has an explained total variance ratio of 64.48%, which is above the recommended values in the literature (50%-60%) (Williams et al., 2010). Additionally, the factor loadings of the scale items are above the minimum value for evaluating the autonomous behaviors related to the professional roles of nurses (Celebi Cakiroglu and Baykal, 2021; Schmitt, 2011).

CFA is used to test whether the factor structure obtained with EFA is sufficient to explain the model, and it requires the calculation of model fit indices (Kline, 2015). In this research, the fit index values of the scale were found to be in line with the literature, with RMSEA (0.008), NFI (0.93), NNFI (0.93), SRMR (0.09), and CFI (0.95) values (Cabrera-Nguyen, 2010).

Convergent and discriminant validity assessments were conducted to test the tendency of scale items to confirm each other. Compound reliability (CR) and average variance explained (AVE) are examined in this evaluation, where CR is expected to be 0.6 and above, and AVE is expected to be 0.5 and above (Celebi Cakiroglu and Baykal, 2021; Kline, 2015; Ylinen and Gullkvist, 2014). In this context, the results of both convergent and discriminant validity of the scale are above the acceptable value. These results confirm that the four-factor structure of the scale is sufficient.

The reliability of the scale was evaluated with test-retest and Cronbach's alpha internal consistency coefficient methods. In the test-retest method, the correlation coefficient is calculated, and in line with the literature (where a result of +1 indicates a positive and excellent relationship), there was a consistent, strongly positive, and significant relationship in the research (total scale t: 0.619, $p < 0.619$), and the total scale r: 0.983, $p < 0.001$) (Tabachnick and Fidell, 2013).

For a scale to be considered reliable, the Cronbach's Alpha coefficient should be in the range of 0.70 to 0.99 (Tavakol and Dennick, 2011). The Cronbach's alpha coefficient of ABSRPRN was found to be 0.932 for the overall scale and 0.771, 0.809, 0.918, and 0.896 for the sub-dimensions. The reliability level was found to be high for both the overall scale and the sub-dimensions. The research results indicate that ABSRPRN is a valid and reliable measurement tool.

**Scale Contents:** The ABSRPRN, developed to assess autonomous behavior scale regarding professional poles of nurses consists of four dimensions: care, education, research, and management. The scale reflects nurses' autonomous behaviors within the framework of their professional roles.

Factor 1, containing items reflecting nurses' behaviors related to the caregiving role, is named "care." This factor supports studies emphasizing the key role of autonomy in the caregiving role, which is the most fundamental role of nurses for the success of the profession (Bonsall and Cheater, 2008; Erikmen and Vatan, 2019).

Factor 2, containing items reflecting nurses' behaviors related to the educational role, is named "education." The educational role in nursing impacts various areas, from maintaining and improving the current health level of individuals, families, and the community to enhancing health behaviors in cases of illness, and even extending to the education of colleagues and student nurses (Jenkins, 2005; Karadağ and Taşçı, 2005). This factor emphasizes another area where nurses can exhibit high levels of autonomous behavior.

Factor 3, containing items reflecting nurses' behaviors related to the research role, is named "research." This role involves conducting research to advance the caregiving role with scientific and evidence-based knowledge, ensuring that research findings are applied in nursing care practices, and disseminating research findings nationally and internationally to make information accessible to nurses (Bonsall and Cheater, 2008). This factor emphasizes an area that supports nurses' autonomy and professional development.

Factor 4, containing items reflecting nurses' behaviors related to the managerial role, is named "management." The primary purpose of the managerial role is to appropriately organize all areas affecting nursing care, thereby supporting the fundamental task of care. In this context, nurses perform various management processes, including communication, teamwork, human resource management, risk management, and crisis management. The effectiveness and efficiency of health services, which have a complex and multidisciplinary structure in today's world, greatly depend on nurses fulfilling their managerial roles appropriately (Jenkins, 2005). This factor emphasizes an area that particularly supports decision-making skills and contributes to autonomy for nurses.

## Conclusion and Recommendation

The newly developed ABSRPRN is a valid and reliable measurement instrument. The 23-item scale consist of four subdimension, including care (6 items), education (4 items), research (6 items), and management (7 items). This scale which has good psychometric properties can be used to evaluate the autonomous behavior scale regarding professional roles of nurses. Although the basic features of this scale are sound, it is recommended that the developed ABSRPRN be tested in different and larger samples and with different variables. It is thought that using the scale in different studies will increase awareness of autonomy in nursing. In this study, the features of the English version of the scale were not tested in English-speaking countries. The establishment of cooperation in the international community may allow the features of the English version of the scale to be tested in the future.

**Author Contribution:** The authors confirm contribution to the paper as follows; study conception and design: GA, ÜB; data collection: GA; analysis and interpretation of results: GA, ÜB; draft manuscript preparation: GA, ÜB. All authors reviewed the results and approved the final version of the manuscript.
**Ethics Committee Approval:** Istanbul University Cerrahpaşa, Cerrahpaşa Faculty of Medicine Clinical Research Ethics Committee approval was obtained (Date: 06.10.2020 - Number: 59491012-604.01.02).
**Conflict of Interest:** The authors declare that there is no conflict of interest.
**Funding:** The authors declare that the study has no financial support.
**Informed Consent:** Informed consent of the participants were obtained.

**Yazarlık Katkısı:** Yazarlar makaleye katkılarını şu şekilde beyan etmektedir; çalışma fikri ve tasarımı: GA, ÜB; veri toplama: GA; sonuçların analizi ve yorumlanması: GA, ÜB; aday makalenin hazırlaması: GA, ÜB. Tüm yazarlar sonuçları gözden geçirdi ve makalenin son halini onayladı.
**Etik Kurul Onayı:** İstanbul Üniversitesi Cerrahpaşa, Cerrahpaşa Tıp Fakültesi Klinik Araştırmalar Etik Kurulu tarafından onaylanmıştır (Tarih: 06.10.2020 - Karar No: 59491012-604.01.02).
**Çıkar Çatışması:** Yazarlar herhangi bir çıkar çatışması olmadığını beyan ederler.
**Finansal Destek:** Yazarlar çalışmanın finansman desteği olmadığını beyan ederler.
**Katılımcı Onamı:** Katılımcıların bilgilendirilmiş onamları alınmıştır.

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